

CLAIMS

What is claimed is:

1. A method for delivering NO to the cells in a mammal, comprising administering low molecular weight nitrosating agent to the mammal.
2. A method for increasing the O₂-delivery capacity of RBCs in a mammal, comprising administering low molecular weight nitrosating agent to the mammal.
3. A method for scavenging oxygen free radicals in a mammal, comprising administering low molecular weight nitrosating agent to the mammal.
4. A method for preserving a living organ, comprising incubating the organ in a solution of S-nitrosated hemoglobin and low molecular weight thiol.
5. A method for treating malaria in a patient, comprising the steps of:
 - a) isolating the patient's red blood cells;
 - b) treating the patient's red blood cells with S-nitrosothioly, and
 - c) readministering to the patient the red blood cells.
6. A method for treating a disease or medical disorder in a mammal, comprising administering to the mammal a nitrosating agent.
7. The method of Claim 6 in which the nitrosating agent is selected for rapid entry into the target cell.

Sub A
5 8. The method of Claim 6, wherein the disease or medical disorder is selected from the group consisting of: shock, angina, stroke, reperfusion injury, acute lung injury, sickle cell anemia and infection of the red blood cells.

Sub B
9. A preparation of SNO-Hb[FeII]_2 , which is S-nitrosylated without detectable oxidization of the heme Fe.

Sub B
10. A method for making SNO-Hb[FeII]_2 , which is specifically S-nitrosylated on thiol groups, comprising incubating excess nitrosating agent with purified hemoglobin in the presence of oxygen.

11. The method of Claim 10 in which the nitrosating agent is a low molecular weight S-nitrosothiol.

Sub A
15 12. A preparation of SNO-Hb[FeII]_2 , which is S-nitrosylated without detectable oxidation of the heme Fe.

Sub B
13. A method for making SNO-Hb[FeII] , which is specifically S-nitrosylated on thiol groups, comprising incubating excess nitrosating agent with purified hemoglobin in the absence of oxygen.

20 14. The method of Claim 13 in which the nitrosating agent is a low molecular weight S-nitrosothiol.

Sub B
23 15. A method for regulating delivery of oxygen and NO, in various redox forms, in a mammal, comprising administering to the mammal a mixture of a low molecular weight thiol or nitrosothiol and hemoglobin or S-nitrosohemoglobin, selected for the oxidation state of the heme iron and for the oxygenation state.

16. A method for delivering NO in a mammal, comprising administering to the mammal a blood substitute comprising S-nitrosohemoglobin.

17. The method of Claim 16, in which the blood substitute comprises S-nitrosohemoglobin and low molecular weight S-nitrosothiol.

18. A method for scavenging oxygen free radicals and NO[•] in a mammal, comprising administering to the mammal a blood substitute comprising S-nitrosohemoglobin.

19. A method for reducing blood pressure in a mammal, comprising administering SNO-Hb to the mammal.

20. A method for treating a disease in a mammal, comprising administering a form of SNO-Hb to the mammal, wherein the disease is selected from the group consisting of heart disease, vascular disease, atherosclerosis, lung disease and inflammation.

21. A method for treating a medical condition in a mammal, comprising administering a form of SNO-Hb to the mammal, wherein the medical condition is selected from the group consisting of stroke, angina and acute respiratory distress.

22. A method for enhancing the preservation of an excised organ, comprising storing the organ in a solution comprising SNO-Hb(FeII)O₂.

23. A method for treating a human with sickle cell anemia comprising administering to the human a preparation comprising SNO-Hb(FeII)O₂.

24. The method of Claim 23 in which the preparation comprises SNO-Hb(FeII)₂O₂ and a thiol.

25. The method of Claim 23 in which the preparation comprises SNO-Hb(FeII)₂O₂ and an S-nitrosothiol.

5 26. A method for treating a patient having a disease or medical condition characterized by abnormalities of nitric oxide and oxygen metabolism, comprising administering to the patient an effective amount of a preparation comprising SNO-Hb.

10 27. The method of Claim 26 in which the disease or medical condition is selected from the group consisting of: heart disease, lung disease, sickle-cell anemia, stroke or organ transplantation.

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